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HIGH RESOLUTION CROSS-SECTIONING OF POLYSILICON FEATURES WITH A DUAL BEAM TOOL

Abstract

A method for high resolution cross sectioning of polysilicon features with a dual electron (E) beam and focused ion beam. The method comprises consecutive steps of encapsulating the polysilicon features of interest with a metal coating, followed by ion beam cross sectioning of the metal encapsulated polysilicon features, followed by electron (E) beam and gas (XeF2) etching and cleaning of the polysilicon from the encapsulating metal to remove the polysilicon while leaving the polysilicon surface features preserved in the encapsulating metal. The method is practiced with a dual beam tool comprising a scanning electron microscope (SEM) and a focused ion beam tool. Advantageously, in the electron (E) beam and gas etching and cleaning step, the cleaning and imaging are simultaneous, allowing E beam imaging while the cleaning is taking place to evaluate the extent of cleaning. The step of etching and cleaning is followed by scanning electron microscope (SEM) imaging and evaluation of the metal preserved

polysilicon features.